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A Case Study Comparing Fingerspelling Production Between Two Interpreters with EIPA Scores of 3.0 and 4.0.

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Abstract of Thesis:

Approximately 14% of Deaf and hard-of-hearing (D/HH) students in K-12 educational settings use a sign language interpreter for access to the general education curriculum and the classroom environment . The Educational Interpreter Performance Assessment (EIPA) is commonly used to evaluate the skills of an interpreter as a prerequisite of being hired. This case study analyzes and evaluates the fingerspelling (FS) production of two American Sign Language interpreters while interpreting a lesson. The two interpreters had different EIPA scores: one had recently attained a 3.0 and the other held a 4.0 rating. The data shows marked differences in fingerspelling production in the areas of spelling accuracy, hand and arm posture, and individual letter articulation.

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Literature Review

Deaf and hard of hearing (D/HH) children are generally at risk academically due in large part to the lack of a strong first language (Easterbrooks, et al, 2015). With technical advances such as hearing aids and cochlear implants, individuals may have access to more sound but may still struggle to acquire a complete language. Additionally, in 2013 over 75% of D/HH students were placed into general education settings with approximately 14% of those students using sign language interpreters (Anita, 2013). In some districts, educational interpreters could be placed in elementary settings ranging from kindergarten reading to a fifth grade science experiment and then be assigned to interpret for secondary academics or activities such as drama clubs or sporting practices. These daily needs and expectations may fluctuate based on students' needs or staff absences (Seal, 2004).

The young field of sign language interpreting continues to evolve as a profession in both the community and in academic environments. The first educational interpreters were often those who had deaf family members but no formal training in the interpreting process or the intricacies of education. Research has shown that meeting the multi-faceted needs of D/HH students in K-12 settings is extremely complex (Smith, 2010). In 2019, the National Association of Interpreters of Education published professional standards and guidelines unique to educational interpreters. Standard II recommends that at a minimum, a qualified educational interpreter has passed the written test and achieved at least a 4.0 on the Educational Interpreter Performance Assessment (Brown, Guynes, & Tuttle, 2019).

The Educational Interpreter Performance Assessment (EIPA) rates skill levels of interpreters using numerical indices on a scale of 0-5, with 5 being the highest attainable score.

The EIPA evaluates 38 different skills areas that are averaged together for an overall score ranging from 0-5 rounded to the nearest tenth of a point (Schick, Williams, & Kupermintz, 2005). The four main areas of evaluation are I. Voice-to-Sign, II. Sign-to-Voice, III. Vocabulary, and IV. Overall factors. On the EIPA rating form, of the 38 different skill areas, five specifically pertain to fingerspelling (Figure 1).

Current EIPA Standards

Deaf and hard-of-hearing (D/HH) students require alternative communication pathways to access the general education curriculum full access to education. This right to accessibility has been legislated through the Americans with Disabilities Act (1990), Public Law 94-142 (1975) and the Individuals with Disabilities Education Act (IDEA) in 2004. Interpreters with a 3.0 intermediate EIPA score are often hired to work in schools even though they convey approximately 60-70% of the information that exists in the source language (Schick, Williams, & Kupermintz, 2005). According to the Office of Special Education Programs (OSEP) Project at the University of Northern Colorado, only 11 states require educational interpreters to have a 4.0 EIPA score as a condition of employment (Johnson, 2014). In 2017, the Nebraska Department of Education adapted the Special Education Program Standards as part of Rule 51 to increase the minimum score on the EIPA from a 3.5 to a 4.0 for educational interpreters. Moreover, 12 states only require a 3.0 EIPA score or have no interpreter level standard altogether (Johnson, 2014). In 1989, Quinsland & Long presented a conference paper to the American Education Research Association that D/HH students recalled nearly double the information from a skilled interpreter compared with an untrained interpreter.

Fingerspelling

Deaf adults tend to fingerspell 10-15% of a signed discourse depending on the topic (Baker 2010). Fingerspelling is a linguistic feature of sign languages in which letters from spoken language alphabets are represented by conventionalized handshapes (Sandler & Lillo-Martin, 2006). Fingerspelling can be neutral to identify words which do not have a sign such as proper nouns. It can also be used in abbreviations, two-word compounds, initialized signs, signed-fingerspelled compounds, and lexicalized signs (Nicodemus, 2017).

When fingerspelling, letters are linguistically considered to be free morphemes. These morphemes can also become lexicalized, which means they become word-like as an independent sign due to a change in their structure or phonological movement (Valli, 2011). Linguists Keane and Brentari (2016) have concluded that fingerspelling can be used to visually represent the phonology of an English word and Lederberg, et al further show the importance of fluent production of fingerspelled words (2019). Additionally, Schick and Haptonstall-Nykaza (2007) found that D/HH students were better able to recognize and write new English print words as well as fingerspell the words, when training incorporated lexicalized fingerspelling rather than signs with their orthographic representation.

Methodology

Fingerspelling is just one of many overlapping factors involved in successful interpreting and ultimately student achievement. This case study differentiates the fingerspelling (FS) production variation between an interpreter with a 3.0 and an interpreter with a 4.0 on the EIPA.

Participants

The interpreters selected for this study were recruited through the Training and Assessment Systems for K-12 Educational Interpreters (TASK-12) partnership that works with educational interpreters in 13 states. The selection criteria required interpreters who were working a minimum of 20 hours per week interpreting in K-12 educational settings. They were required to hold a bachelor's degree in any field except in the core content area of the study and an EIPA score that was reported within the past 12 months before the initiation of the study. One interpreter had recently attained a 3.0 EIPA rating and the other held a 4.0 EIPA rating.

The six students selected for this study ranged in ages from twelve to seventeen with a minimum of five years using sign language. Three were male and three were female. All six utilized some form of assistive listening device- three used hearing aids and three had cochlear implants. The students' parents signed informed consent forms for participation in the pilot study.

The instructor for the lessons was certified in both D/HH education and in science. This instructor had forty years of teaching experience in a school for the D/HH and was given a lesson plan to implement prior to the data collection sessions. Each session was designed to be completed in one hour.

Lesson Plans

Lesson plans were developed by a credentialed teacher of the deaf and provided to the science teacher in this study one week in advance of the recorded sessions. Each lesson plan followed the "5 E" structure with the sections Engage, Explore, Explain, Elaborate, and Evaluate. Each lesson plan began with an opening activity, was followed by observations and discussion, then by explanation, then by challenging questions, and then by a brief review prior

to the post-test. All lessons included a hands-on lab portion. Lesson plans were created to ensure that the material on the multiple choice tests was covered in the lesson.

Data Collection

Data was recorded during two different class sessions with cameras from four different angles. This data was collected under IRB approval. The teacher and the students remained the same for both interpreters.

Each session used four cameras placed in four areas of the classroom to ensure the teacher, the students, and the interpreter were recorded for the entirety of each data collection session. Following the lesson and post-test, a native signing Deaf adult conversed with the students about their experiences during the lesson. This conversation was recorded, but the teacher and researchers were not in the room at the time.

Data Analysis Procedure

For this study, the author analyzed the video data by documenting the time stamp and the observed fingerspelled product (Figures 2 & 3).

The EIPA Rating Form includes three specific skills related to fingerspelling: production of FS, correct spelling, and appropriate use of FS. An analysis rubric was created to quantitatively document the type of error and how many errors were made based on Marty Taylor's *Interpretation Skills* (2018) parameters. This rubric included the skill categories: spell the word correctly, FS essential source language (L1) terms, accurate FS for clarity, emphasis, importance, and uniqueness, articulate individual letters clearly, FS words at understandable pace, correct arm and hand composure, move FS hand appropriately in space, accurate FS regardless of length of word, and accurate FS desptie time constraints. After the FS occurrences

were documented, the author reviewed each occurance and categorized it according to its corresponding skill categories. The rubric and data can be seen in Figure 4.

Results

The 3.0 interpreted sample recording lasted for 1 hour and 17 minutes. For the purpose of this analysis, in this sample there were 82 recorded fingerspelling entries. Of these entries, nine words were spelled incorrectly and nine words were also not clearly articulated. There were six recorded errors of the interpreter's arm and hand posture and four recorded errors of the interpreter's hand moving appropriately in space. There was one recorded error in each of the areas 1.11 accurate fingerspelling regardless of word length and 1.12 accurate fingerspelling despite time constraints. Samples of fingerspelling errors are included in Figure 2.

For the categories of 1.2, fingerspelling of essential source language terms, and 1.4, accurate fingerspelling of words for clarity, emphasis, importance, or uniqueness, an observation was made if the interpreter accurately completed this skill or if an attempt was made but done so incorrectly. For the 1.2 observation, the 3.0 interpreter accurately completed the skill 34 times with 7 words; gas, liquid, matter, conduct(tion), atom(s), insulator, and conduit. The 4.0 interpreter accurately completed this skill 13 times with 5 words; electron, battery, energy, magnet, and electricity. Neither interpreter had any errors. For the 1.4 skill, the 3.0 interpreter attempted this skill twice but produced errors, whereas the 4.0 interpreter successfully completed this skill 12 times (Figures 2, 3, & 4).

The 4.0 interpreted sample recording lasted for 1 hour and 10 minutes. For the purpose of this analysis, in this sample there were 53 recorded fingerspelling entries. As with the previously

discussed categories and among the remaining categories, there were no observable errors in the 4.0 interpreter's fingerspelling production.

For the purpose of this study, there was not an analysis which focused on errors of omission, therefore any initial fingerspelling omission observations were dismissed from the data (with the exception of entry 2:15 for the 3.0 interpreter because it was an error of fingerspelling an essential L1 term) . There were additional fingerspelling instances that were initially recorded but were dismissed from final data analysis due to an unclear or video obstruction.

Discussion

Fingerspelling provides access to specialized English vocabulary, proper names, and is essential in achieving functional linguistic equivalence. The results of the analysis display a variance in performance between an interpreter with a 3.0 and 4.0 EIPA rating.

On the basic skill of spelling words correctly, the 4.0 interpreter accurately spelled all the words but the 3.0 interpreter only spelled 89% of the words correctly. It was also noticeable that the 3.0 interpreter had incorrect arm and hand posture 7.4% of the time, whereas the 4.0 interpreter always maintained appropriate arm and hand posture in these samples. This is notable because unclear posture can cause the fingerspelled word(s) to be imprecise, even causing errors in articulation. It is more difficult for words to be discerned therefore increasing the possibility of misunderstanding or confusion by the student. The 3.0 interpreter had nine words that were not clearly articulated, meaning that a student would not be able to comprehend the fingerspelling. Again, the 4.0 interpreter showed no error in fingerspelling articulation.

One must consider how these errors by the 3.0 interpreter may impact a student's access to education. The students may not get complete access to the message because of the incorrect spellings or the inability to see the fingerspelling due to the posturing. . As Yarger (2001) discusses, many interpreters are being hired who are unqualified to interpret for a child's education. Moreover, as shown in the OSEP project data, twelve states only require a 3.0 EIPA or have no minimum standard established. The results of this case study support the research that an interpreter with a 3.0 may not be qualified to interpret for a students education, as they consistently make more errors than a 4.0 interpreter, even in the specified sub-skill of fingerspelling.

There are limitations to consider for this case study. One limitation is that it is focused on only two interpreter performances in just two lessons. This is limiting since interpreter performance can vary depending on daily demands such as environmental distractions, interpersonal relationships, or interpersonal thoughts and feelings. Another is that the analysis was only conducted by one observer. Adding another observer to validate the observations would be preferred.

Educational interpreters are vital for a Deaf or Hard-of-Hearing student's access to all aspects of education including the content areas, social interactions, and peer relationships. In one of the first studies to compare direct education and interpreted education, Kurz and his colleagues noted that D/HH students in science classes experience more difficulties with the interpreted classes (Kurz, Hauser, & Schick, 2015). It is imperative that interpreters are qualified for the position for which they are hired. This case study has addressed the variance of two interpreters' fingerspelling production. It has clearly highlighted the discrepancy between the

fingerspelling skills of an interpreter with a 3.0 EIPA rating and a 4.0 EIPA rating. Additional research could explore the correlation between fingerspelling as a fundamental interpreting skill and additional EIPA categories. Future studies including more participants would illustrate variations between interpreters' performances. Additionally, a longitudinal research study tracking interpreters' qualifications and student achievement may help to show the impact a qualified or unqualified interpreter can have on a student's education.

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Figure 1

EIPA Rating Form

The following are domains of skills and specific skills evaluated by the EIPA.

I. Interpreter Product − Voice-to-Sign

Prosodic Information:

A. Stress/emphasis for important words or phrases	0 1 2 3 4 5
B. Affect/emotions (interpreter appropriately uses face and body)	0 1 2 3 4 5
C. Register	0 1 2 3 4 5
D. Sentence boundaries (not run-on sentences)	0 1 2 3 4 5
Non-manual information:	
E. Sentence types/clausal boundaries indicated	0 1 2 3 4 5
F. Production and use of non-manual adverbial/adj. markers	0 1 2 3 4 5
Use of signing space:	
G. Use of verb directionality/pronominal system	0 1 2 3 4 5
H. Comparison/contrast, sequence and cause/effect	0 1 2 3 4 5
I. Location/relationship using ASL classifier system	0 1 2 3 4 5
Interpreter performance:	
J. Follows grammar of ASL or PSE (if appropriate)	0 1 2 3 4 5
K. Use of Eng. Morphological markers (if appropriate)	0 1 2 3 4 5
L. Clearly mouths speaker's English (if appropriate)	0 1 2 3 4 5

II. Interpreter Product − Sign-to-Voice (i.e., fluency/pacing, clarity of speech, volume of speech)

Can read and convey signer's:	
A. Signs	0 1 2 3 4 5
B. Fingerspelling and numbers	0 1 2 3 4 5
C. Register	0 1 2 3 4 5
D. Non-manual behaviors and ASL morphology	0 1 2 3 4 5
Vocal/Intonational features:	
E. Speech production (rate, rhythm, fluency, volume)	0 1 2 3 4 5
F. Sentence/clausal boundaries indicated (not run-on speech)	0 1 2 3 4 5
G. Sentence types	0 1 2 3 4 5
H. Emphasize important words, phrases, affect/emotions	0 1 2 3 4 5
Word choice:	
I. Correct English word selection	0 1 2 3 4 5
Interpreter performance:	
J. Adds no extraneous words/sounds to message	0 1 2 3 4 5

III. Vocabulary

Signs:	
A. Amount of sign vocabulary	0 1 2 3 4 5
B. Signs made correctly	0 1 2 3 4 5
C. Fluency (rhythm and rate)	0 1 2 3 4 5

D. Vocabulary consistent with the sign language or system 0 1 2 3 4 5
E. Key vocabulary represented 0 1 2 3 4 5

Fingerspelling:

F. Production of fingerspelling 0 1 2 3 4 5
G. Spelled correctly 0 1 2 3 4 5
H. Appropriate use of fingerspelling 0 1 2 3 4 5
I. Production of numbers 0 1 2 3 4 5

IV. Overall Factors

Message processing:

A. Appropriate eye contact/movement 0 1 2 3 4 5
B. Developed a sense of the whole message V-S 0 1 2 3 4 5
C. Developed a sense of the whole message S-V 0 1 2 3 4 5
D. Demonstrated process lag time appropriately V-S 0 1 2 3 4 5
E. Demonstrated process lag time appropriately S-V 0 1 2 3 4 5

Message clarity:

F. Follow principles of discourse mapping 0 1 2 3 4 5

Environment:

G. Indicates who is speaking 0 1 2 3 4 5

Figure 2

EIPA Score 3.0 Interpreter

Time Observation

0:05 hand moving
0:30 GAS
0:40 LIQUID
0:40 GAS
1:08 MATTER
~~1:09 Omits a student name.~~
1:16 MATTER
1:42 MATTER
1:50 MATTER
2:09
2:12 MATTER
2:15 omits FS important vocab "states"
2:28 AIR unclear A-I
2:30 GAS
2:46 NERF
3:00 used sign SOLID when it should have been FS
3:04 MATTER
3:10 #ALL MATTER
3:17 MATTER
3:17 CONDUCTION
3:30 MATTER, MATTER
3:41 MATTER
3:42 ATOMS, #ALL
3:55 MATTER
4:05 #OH
~~4:30 omits students name~~
5:12 CONDUCT
~~5:25 INSULATE --> spelled wrong?~~
6:05 ATOMS
6:28 ATOMS
6:40 ATOMS
7:12
7:20 PLASTIC bumpy/palm orientation
7:22 INSULATOR
7:25 ATOMS
10:50
~~11:57 Omits names~~
12:07 unclear
13:00 COPPER
17:50
19:30 doesn't finish clearly
19:46 incorrect wrist/palm orientation
~~23:15 Omits M&M (error?) I personally may not have~~
24:00 ALUMINUM fast
~~25:26 AL-- Omits~~
29:30 name sign? otherwise unclear
29:40 #GO
32:00 STEEL WOOL
~~35:15 COPPER Omits~~
36:20 PLASTIC palm orientation down
36:33 OFF error "out"
36:56 OFF error "out" more unclear, too fast
39:55 CONDUIT not emphasized
40:25 OH
42:09 "on" fast and unclear
43:18 CONDUIT
~~43:35 Omits name~~
43:35 CONDUIT
44:20 CONDUIT uneven pace c.o.n duit
44:25 CONDUIT
44:30 INSULATOR maybe wrong?
47:20 #ALL
~~47:30 "good work" error- should be "good AI-O-B"~~
49:05 not fully FS
49:16

UPPERCASE = Fingerspelled (FS) words
# = Lexicalized FS words
* = 1.1 Error
* = 1.2 Accurately Completed
* = 1.2 Error
* = 1.4 Accurately Completed
* = 1.4 Error
* = 1.5 Error
* = 1.7 Error
* = 1.9 Error
* = 1.10 Error
* = 1.11 Error
* = 1.12 Error
~~Strikethrough~~ = Not included in final data and analysis

82 fingerspelling entries
16 entries are student names

~~49:29 Omits names~~
49:25
*** 49:40 STEEL unclear
~~49:49 omits "wasF~~
~~50:15 unclear~~
52:30 M&Ms
52:35 M&Ms
53:05 M&Ms
53:23 M&Ms
57:31 M&Ms
* 57:42 last
~~57:50 omission~~
** 58:05 POLITE maybe not need to FS? palm orientation incorrect
58:34 POLITE
** 59:45 fast
*** 1:00:40 SENTENCE not clear/slurred ending "e-n-c-e"
1:01:24 ATOM
1:01:25 THIS ATOM
1:01:37 ATOM
1:01:42 ATOM
1:01:45 ATOMS #ALL MATTER
1:01:45 ATOMS #ALL MATTER

10:28 Comments
The students stated that the interpreters fingerspelling was unclear, slurred, and lazy. Stated the interpreter should be clear throughout the whole word.
11:50 Comments
The students prefer last week's (4.0 EIPA) interpreter because she followed the teacher better, signed more accurately, and used a more ASL structure.

This document has been edited to protect the names of the participants involved

Figure 3

EIPA Score 4.0 Interpreter
Observation

UPPER CASE= Fingerspelled (FS) words
= Lexicalized FS words
* = 1.2 Accurately Completed
* = 1.4 Accurately Completed
~~Strikethrough~~ = Not included in final data and analysis

53 fingerspelling entries
21 entries are student names

Time	Observation
0:32	
0:40	
0:48	
2:00-3:15	The interpreter is out of frame. I can't see her performance
* 3:20	ELECTRON sets up E for the sign. However, it was unclear at first, looked like electronee
* * 3:49	ELECTRON emphasizes correctly
* 3:52	ELECTRON
4:00-4:45	The interpreter is out of frame. I can't see her performance
5:20-6:45	The interpreter is out of frame. I can't see her performance
6:50	
* 7:10	DYING emphasized the ING to match the teachers emphsis of the English past tense.
7:18	
7:47	
8:06	
~~8:47~~	~~Omits~~
* 8:58	ELECTRON
11:37	
14:45	
* * 15:05	BATTERY fingerspelled to clarify a sign
* * 15:25	BATTERY fingerspelled to clarify a sign
15:28	
16:22	
17:49	
18:25	
19:55	
20:40	
21:04	
21:34	
21:54	
* * 22:59	BATTERY fingerspelled to clarify a sign
27:47	#ALL
~~28:08~~	~~Omits~~
~~29:06~~	~~Omits~~
30:10-30:30	The interpreter is out of frame. I can't see her performance
~~30:40~~	~~Omits~~
31:17	OFF
31:55-32:05	OFF many times b/c the teacher says "off, on, off, on ,off, on ,off, on, off"
~~32:53~~	~~Omits~~
~~33:45~~	~~Omits~~
36:10	
36:10	
36:27	#ALL
37:42	
* 39:04	SWITCH used to clarify the sign/essential English term
41:05	BUS, BUS
41:10	VAN
* 42:00	ENERGY used b/c essenial English term
* 42:40	OIL to specify sign
42:55	IRON
43:00	OIL
43:00	IRON
* 43:25	SIGN for IRON clarifying because the word "sign" was confused with the sign for an asl sign rather than a symbol.
* 43:50	MAGNET essential English term
* 44:55	MAGNET essential English term
* * 45:03	ELECTRICITY used to specify sign/essential English term
* 45:07	MAGNET
* 45:17	ELECTRON essential English term
* * * 46:10	IRON FE IRON, used to emphasize
47:51	#BACK
~~52:00~~	~~Omits~~

57:50 Comments Facilitator: Could you understand the interpreter?
Student 1: I could understand her but she would put her hands down very fast. I would watch both the teacher and the interpeter. She spelled me name wrong. It should be
Student 5: Ive only been signing for abaout 3 years. I could understand her, it was alright but I watched the teacher more.
Student 2: I could understand the interpreter well. Sometimes it can be hard going between watching the teacher and the interpeter
Student 3: I watched the interpeter
Student 4: I could understand the teacher without watching the interepter
1:08:00 Facilitator: Do you prefer the interepter or the teacher to sign?
Student 2 and Student 3 respond an intepreter because their signs are more clear and the teacher can tend to favor talking and miss signs
Student 5 prefers the teacher to sign
Student 4 listens to the teacher, does not rely on sign

This document has been edited to protect the names of the participants involved

Figure 4

Skill		Observation	3.0 Interpreted Sample	4.0 Interpreted Sample
1.1	Spell the word Correctly	Yes	73	53
		No	9	0
1.2	FS essential L1 terms	Accurately completed	34 (7 novel)	13 (5 novel)
		Error	2	0
1.4	Accurate FS for clarity, emphasis, importance, and uniqueness	Accurately completed	0	12
		Error	2	0
1.5	Articulate individual letters clearly	Yes	73	53
		No	9	0
1.7	FS words at understandable pace	Yes	79	53
		No	3	0
1.9	Correct arm and hand composure	Yes	76	53
		No	6	0
1.10	Move FS hand appropriately in space	Yes	78	53
		No	4	0
1.11	Accurate FS regardless of length of word	Yes	81	53
		No	1	0
1.12	Accurate FS desptie time constraints	Yes	81	53
		No	1	0
Total FS words analyzed			82	53